NON-PUBLIC?: N
ACCESSION #: 9111010029
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Maine Yankee Atomic Power Company PAGE: 1 OF 2

DOCKET NUMBER: 05000309

TITLE: Plant Trip on Main Transformer Failure
EVENT DATE: 04/29/91 LER #: 91-005-01 REPORT DATE: 10/25/91

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 7 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Ethan B. Brand, Nuclear Safety TELEPHONE: (207) 882-6321
Engineer

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: EL COMPONENT: XFMR MANUFACTURER: G080
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: Yes

ABSTRACT:

On April 29, 1991, Maine Yankee tripped from 100% power when one of the two main output transformers developed an internal fault. The electrical fault in the main transformer X-1A resulted in a generator primary relay trip of the main turbine. The Reactor Protective System tripped the reactor on Loss of Load. Protective relaying and the automatic transfer to reserve power performed as designed.

The transformer fault caused arcing at the neutral bus beneath the main generator. The arcing damaged hydrogen lines and the neutral leads bushings and resulted in a hydrogen fire beneath the main generator. The plant declared an Unusual Event due to the fire, which was allowed to burn itself out over a 3 hour period.

The damaged transformer has been replaced with an on-site spare (X-1S). The main generator repairs were completed and the plant resumed operation

on May 31, 1991.

Two transformer failures (without fires) occurred previously at Maine Yankee on August 13, 1988 (X-1A) (LER-88-006), and on August 31, 1978 (X-1B).

The root cause of the transformer fault was an internal fault to ground. The transformer (X-1A) had been rebuilt following the fault in 1988 and had been in service for approximately 9 months.

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END OF ABSTRACT



On April 29 1991, Maine Yankee tripped from 100% power when one of the two main output transformers developed an internal fault. The electrical fault in the main transformer X-1A resulted in a generator primary relay (86P) trip of the main turbine (TRB). The Reactor Protective System (JC) tripped the reactor on Loss of Load. Protective relaying and the automatic transfer to reserve power performed as designed.

The transformer fault current caused the main generator neutral bus potential to rise high enough to cause arcing between the neutral bus and neutral bus enclosure. The arcing damaged adjacent hydrogen lines, neutral bushings and the neutral enclosure. Hydrogen leakage from damaged lines and neutral bushings ignited, resulting in a fire below the main generator. The plant fire brigade responded and the generator was purged with carbon dioxide to remove the source of hydrogen and to allow the fire to self-extinguish over a 3 hour period.

The transformer fault caused an overpressure and rupture of the transformer casing. The expelled hot oil initiated the transformer fire protection deluge system. Approximately 150 gallons of mineral based (non-PCB) transformer oil leaked into a storm drain and reached the Back River near the plant. Cleanup of the oil spill is complete.

The fire beneath the main generator damaged the neutral bus and bushings, requiring replacement of these components, Collateral damage was restricted to the immediate area of the neutral bus and bushings, and involved some generator instrumentation and hydrogen lines. Small fires in the immediate area caused by the fire debris resulted in minimal damage to other surrounding equipment.

The plant declared an Unusual Event due to the fire, which burned for

approximately 3 hours.

The ruptured transformer has been replaced with an on-site spare (X-1S). The parallel main transformer X-1B, and the two station service transformers have been examined and tested, with no faults or inconsistencies discovered. The main generator inspection and repairs were completed and the plant resumed operation on May 31, 1991.

Two transformer failures (without fires) occurred previously at Maine Yankee on August 13, 1988 (X-1A) (LER 88-006), and on August 31, 1978 (X-1B).

The transformer (X-1A) is a General Electric 3 phase, 345KV/22KV, 430/600 MVA, forced oil, air cooled unit. The transformer (X-1A) had been rebuilt following the fault in 1988 and has been in service for approximately 9 months.

An evaluation of the root cause of the transformer failure concluded that an internal fault to ground caused the transformer failure. No cause of the internal fault has been determined.

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ATTACHMENT 1 TO 9111010029 PAGE 1 OF 1

Maine Yankee
RELIABLE ELECTRICITY FOR MAINE SINCE 1972

EDISON DRIVE - AUGUSTA, MAINE 04330 - (207) 622-4868

October 25, 1991
MN-91-148 GDW-91-79

UNITED STATES NUCLEAR REGULATORY COMMISSION
Attention: Document Control Desk
Washington, DC 20555

Reference: (a) License No. DPR-36 (Docket No. 50-309)
(b) Maine Yankee Letter to USNRC Dated May 29, 1991
(MN-91-85, LER 91-005-00)

Subject: Maine Yankee Licensee Event Report 91-005-01- Plant Trip on Main Transformer Failure

Gentlemen:

Please find enclosed Maine Yankee Licensee Event Report 91-005-01. This report supplements that information previously provided with Reference (b). Changes to Reference (b) are annotated with brackets in the left margin.

Please contact us should you have any questions regarding this matter.

Very truly yours,

G. D. Whittier, Vice President
Licensing & Engineering

JVW/sjj

c: Mr. Thomas T. Martin
Mr. Charles S. Marschall
Mr. E. H. Trottier
Mr. Patrick J. Dostie

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